

WHAT IS CLAIMED IS:

1. A method of distributing signals in a satellite-based signal distribution system having a plurality of transponder groups, the method comprising:
 - receiving signals from a first satellite transponder group;
 - block converting the signals to an intermediate frequency;
 - adjusting a power of the signals in a variable gain amplifier in an integrated circuit;
 - detecting an output power of the variable gain amplifier with a detector in the integrated circuit; and
 - adjusting a gain of the variable gain amplifier, in part, based on a result of detecting the output power.
2. The method of Claim 1, further comprising:
 - connecting an output of the variable gain amplifier to an in-line signal path;
 - and
 - connecting the output of the variable gain amplifier to a cascade signal path.
3. The method of Claim 1, wherein adjusting the power of the signals comprises amplifying the signals in the variable gain amplifier.
4. The method of Claim 1, wherein adjusting the power of the signals comprises attenuating the signals in the variable gain amplifier.
5. The method of Claim 1, wherein adjusting the gain of the variable gain amplifier comprises adjusting the variable gain amplifier to selectively amplify or attenuate the signals.
6. The method of Claim 5, wherein adjusting the gain of the variable gain amplifier further comprises adjusting the variable gain amplifier to attenuate the signals when the output power of the variable gain amplifier is greater than a predetermined setpoint.
7. The method of Claim 5, wherein adjusting the gain of the variable gain amplifier further comprises adjusting the variable gain amplifier to amplify the signals when the output power of the variable gain amplifier is less than a predetermined setpoint.

8. The method of Claim 1, further comprising routing an output signal from the variable gain amplifier to one of a plurality of outputs of a crosspoint switch.

9. The method of Claim 1, further comprising band translating an output signal from the variable gain amplifier to one of a plurality of frequency bands.

10. A signal distribution device configured for use in a signal distribution system having a centralized signal input and multiple destination devices in remote locations, the device comprising:

a variable gain amplifier on an integrated circuit substrate, the variable gain amplifier having an input, an output, and a control input, and configured to selectively amplify or attenuate a signal received at the centralized signal input based, at least in part, on a control signal at the control input of the variable gain amplifier;

a power detector on the integrated circuit substrate, the power detector having an input connected to the output of the variable gain amplifier and an output connected to the control input of the variable gain amplifier and configured to provide a detected output based in part on an output power of the variable gain amplifier as the control signal; and

a signal processing device on the integrated circuit substrate, an input of the signal processing device coupled to the output of the variable gain amplifier, an output of the signal processing device coupled to a first output of the signal distribution device.

11. The signal distribution device of Claim 10, wherein the variable gain amplifier further includes a cascade output connected to the variable gain amplifier output and also connected to an output of the signal distribution device.

12. The signal distribution device of Claim 10, wherein the signal processing device comprises a signal splitter.

13. The signal distribution device of Claim 10, wherein the signal processing device comprises a band translation device.

14. The signal distribution device of Claim 10, wherein the signal processing device comprises a crosspoint switch.

15. The signal distribution device of Claim 10, wherein the variable gain amplifier selectively amplifies or attenuates a satellite downlink signal received at the centralized signal input.

16. The signal distribution device of Claim 10, wherein the variable gain amplifier selectively amplifies or attenuates a satellite television downlink signal received at the centralized signal input.

17. The signal distribution device of Claim 10, wherein the variable gain amplifier selectively amplifies or attenuates a cable television signal received at the centralized signal input.

18. The signal distribution device of Claim 10, wherein the variable gain amplifier selectively amplifies or attenuates a terrestrial television signal received at the centralized signal input.

19. The signal distribution device of Claim 10, wherein the variable gain amplifier selectively amplifies or attenuates a telephone signal received at the centralized signal input.

20. The signal distribution device of Claim 10, wherein the variable gain amplifier selectively amplifies or attenuates a data signal received at the centralized signal input.

21. A method of distributing signals in a signal distribution system having a plurality of band stacked signal groups, the method comprising:

receiving a signal group from the plurality of band stacked signal groups;

adjusting a power of the signal group in a variable gain amplifier in an integrated circuit;

detecting an output power of the variable gain amplifier with a detector in the integrated circuit;

adjusting a gain of the variable gain amplifier based, at least in part, on a result of detecting the output power; and

distributing an output signal from the variable gain amplifier to a destination device.

22. The method of Claim 21, wherein detecting the output power of the variable gain amplifier comprises detecting the output power in a frequency band broader than a frequency band of the signal group.

23. The method of Claim 21, wherein detecting the output power of the variable gain amplifier comprises detecting the output power in a frequency band narrower than a frequency band of the signal group.

24. The method of Claim 21, wherein the plurality of band stacked signal groups comprises:

- a first signal group in a 950-1450 MHz frequency band; and
- a second signal group in a 1650-2150 MHz frequency band.

25. The method of Claim 21, wherein adjusting the gain comprises adjusting a positive gain of the variable gain amplifier.

26. The method of Claim 21, wherein adjusting the gain comprises adjusting an attenuation of the variable gain amplifier.

27. A signal distribution device in a signal distribution system having a centralized signal input and multiple destination devices in remote locations, the device comprising:

- a first variable gain amplifier on a first integrated circuit substrate, the first variable gain amplifier having an input, an in-line output, a cascade output, and a control input, and configured to have a gain based, at least in part, on a control signal at the control input of the first variable gain amplifier;

- a first power detector on the first integrated circuit substrate, the first power detector having an input connected to the output of the first variable gain amplifier and an output connected to the control input of the first variable gain amplifier and configured to provide, as the control signal to the first variable gain amplifier, a detected output based on an output power of the first variable gain amplifier;

- a second variable gain amplifier on a second integrated circuit substrate, the second variable gain amplifier having an input connected to the cascade output of the first variable gain amplifier, an in-line output, a cascade output, and a control input, and configured to have a gain based, at least in part, on a control signal at the control input of the second variable gain amplifier; and

- a second power detector on the second integrated circuit substrate, the second power detector having an input connected to the output of the second variable gain

amplifier and an output connected to the control input of the second variable gain amplifier and configured to provide, as the control signal to the second variable gain amplifier, a detected output based on an output power of the second variable gain amplifier.

28. The signal distribution device of Claim 27, wherein the in-line output of the first variable gain amplifier is connected to a first of the multiple destination devices.

29. The signal distribution device of Claim 28, wherein the in-line output of the second variable gain amplifier is connected to a second of the multiple destination devices.

30. The signal distribution device of Claim 27, wherein the gain of the first variable gain amplifier comprises a positive gain.

31. The signal distribution device of Claim 27, wherein the gain of the first variable gain amplifier comprises a negative gain.

32. The signal distribution device of Claim 27, wherein the gain, in dB, of the first variable gain amplifier varies in proportion to the control signal at the control input of the first variable gain amplifier.

33. A method of distributing signals in a satellite-based signal distribution system having a plurality of transponder groups, the method comprising:

receiving signals from a first satellite transponder group;

adjusting a power of the signals in an Automatic Gain Control (AGC) amplifier in an integrated circuit; and

adjusting a gain of the AGC amplifier.

34. The method of Claim 33, wherein adjusting the power of the signals in the AGC amplifier comprises adjusting the power of the signals in an output referred AGC amplifier.

35. The method of Claim 33, further comprising:

connecting an output of the AGC amplifier to an in-line signal path; and

connecting the output of the AGC amplifier to a cascade signal path.

36. The method of Claim 35, further comprising adjusting a power of a signal in the cascade signal path in an additional AGC amplifier.

37. A signal distribution device in a signal distribution system having at least one signal input and one or more destination devices in remote locations, the device comprising:

an output referred Automatic Gain Control (AGC) amplifier, the AGC amplifier having an input, an output, and a control input, and configured to provide a signal gain based, at least in part, on a control signal at the control input of the AGC amplifier; and

a signal processing device having an input of the signal processing device coupled to the output of the AGC amplifier, an output of the signal processing device coupled to a first output of the signal distribution device.

38. The signal distribution device of Claim 37, wherein the signal gain is a positive gain based, at least in part, on the control signal.

39. The signal distribution device of Claim 37, wherein the signal gain is an attenuation based, at least in part, on the control signal.

40. The signal distribution device of Claim 37, wherein the AGC amplifier comprises:

a variable gain amplifier having a gain control input coupled to the control input of the AGC amplifier;

a detector configured to sample a signal after the output of the variable gain amplifier an output of the detector coupled to the gain control input of the variable gain amplifier.

41. The signal distribution device of Claim 40, wherein the detector is configured to sample the signal at the output of the variable gain amplifier.

42. The signal distribution device of Claim 40, wherein the detector is configured to sample the signal at the output of the signal processing device.

43. The signal distribution device of Claim 40, wherein the variable gain amplifier is configured to provide signal gain when the output of the detector is greater than an AGC setpoint.

44. The signal distribution device of Claim 40, wherein the variable gain amplifier is configured to provide signal gain when the output of the detector is less than an AGC setpoint.

45. The signal distribution device of Claim 40, wherein the variable gain amplifier is configured to provide signal attenuation when the output of the detector is greater than an AGC setpoint.

46. The signal distribution device of Claim 37, wherein the AGC amplifier comprises:

- a variable gain amplifier having a gain control input coupled to the control input of the AGC amplifier;

- a detector configured to sample a signal at the input of the variable gain amplifier an output of the detector coupled to the gain control input of the variable gain amplifier.

47. The signal distribution device of Claim 37, further comprising:

- a semiconductor substrate on which the AGC amplifier and signal processing device are manufactured; and

- a cascade output coupled to the output of the AGC amplifier.

48. The signal distribution device of Claim 37, wherein the signal processing device comprises one or more devices selected from the group comprising a signal splitter, a signal combiner, an amplifier, an attenuator, a filter, a band translation device, and a multiplexer.

49. The signal distribution device of Claim 37, further comprising an antenna configured to receive signals from one or more satellites, the output of the antenna coupled to the input of the AGC amplifier.

50. The signal distribution device of Claim 49, wherein the signal processing device comprises a band translation device.

51. The signal distribution device of Claim 37, further comprising a Low Noise Block Converter (LNB) configured to receive a signal from the at least one signal input, frequency convert the received signal, and output the frequency converted signal to the input of the AGC amplifier.